

DYSOSMA: A NEW GENUS OF BERBERIDACEAE¹

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While examining herbarium material of the genus *Podophyllum* in the Gray Herbarium of Harvard University recently, the writer happened upon six sheets of a very curious plant collected in China by Henry in 1854, and also two sheets of similar specimens collected by Ford, and distributed from the Hong-kong Botanic Garden in 1885.

The plants were immediately perceived to be radically distinct from both the North American *P. peltatum* L. and the Asiatic *P. Emodi* Wall. The evident differences are larger size in general, much broader leaves with very shallow and regular lobing, and especially an umbel of four to nineteen flowers instead of the familiar solitary flower of the more common species. Upon a consultation of the literature, it was found that the plants correspond to the description of *P. versipelle* Hance.

A somewhat closer superficial examination disclosed the facts that the pedicels of the inflorescence are distinctly recurved, while those of the more familiar species are erect or slightly nodding, and that the petals are also drooping, oblong-lanceolate in outline, and of a dull reddish color. A difference in the rhizome was also evident, it being thick and fleshy and destitute of scales, with the nodes crowded together almost as a tuber, while the rhizomes of both *P. peltatum* and *P. Emodi* are more like the ordinary creeping stem, if such a distinction can be made, being slender, more fibrous, and giving rise to a conspicuous production of cataphyllary scales (pl. 46, figs. 5 and 10).

Dissections of the species in question disclosed further facts of considerable interest. The stamens of *P. versipelle* are four to six in number, fewer than in the other species, and are about one-half again as large in every dimension as those of both *P. peltatum* and *P. Emodi*. The filaments are sharply curved

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away from the pistil, unguiculate in a certain manner, and the sterile connective is greatly developed, apiculately produced at the apex, and bears the thin locules conspicuously extended in a parallel position from its ventral side. The anthers, moreover, are introrse, one of the most striking features of the species, since the anthers of all other Berberidaceae are extrorse, including those of *P. peltatum* and *P. Emodi* which are also produced laterally from a narrow connective upon straight filaments. Upon an examination with a compound microscope the pollen of *P. versipelle* was found to be perfectly spherical, and about one-half to two-thirds the size of the lobed pollen of *P. peltatum* and *P. Emodi*.

The pistil of *P. versipelle* also produces a definite slender style bearing a globose stigma, while the other two species have peltate stigmas which are sessile or only slightly elevated. The mature fruit of *P. versipelle* is unknown, but it is presumed to be rather similar to the pulpy bacca of *P. peltatum* and *P. Emodi*.

With two such distinct elements as are represented by *P. versipelle*, on the one hand, and *P. Emodi* and *P. peltatum*, on the other, it appears that the equilibrium of the Berberidaceae and the tribe Podophylleae, containing at present only the genus *Podophyllum*, should be more easily maintained by recognizing the elements as distinct genera of a single tribe, since two such genera would be quite as distinct in their separate tribe as those of the other tribes of the family, as, for instance, *Berberis* and *Mahonia*, and *Epimedium* and *Vancouveria* in the Berberideae.

In establishing the new genus, the name *Dysosma* has been constructed from the Greek δῦς + ὀσμή, signifying "a disagreeable odor," chosen arbitrarily upon the testimony of Hance, who was able to examine fresh plants, and who pronounced their odor as most remarkably putrid.

Tabulated, the differences of *Dysosma* and *Podophyllum* have been found to be as follows:

DYSOSMA	PODOPHYLLUM
Rhizome tuberous, without cataphyllary scales or prophylls.	Rhizome a creeping slender stem, with both cataphyllary scales and prophylls.
Flowers in umbels.	Flowers solitary.

DYSOSMA

Pedicels reflexed.

Petals drooping, dull reddish.

Pistil with a definite style.

Stigma globose.

Stamens 4-6, introrse.

Stamens with an enlarged sterile connective.

Filaments unguiculate, spreading away from the pistil.

Leaf-lobes shallow and regular, sharply and regularly denticulate.

Pollen spherical, relatively small.

PODOPHYLLUM

Pedicels erect or only slightly nodding.

Petals spreading, white.

Pistil without a definite style.

Stigma peltate.

Stamens 6-18, extrorse.

Stamens without an enlarged sterile connective.

Filaments straight, not spreading.

Leaf-lobes deep and irregular, entire or irregularly laciniate.

Pollen lobed, relatively large.

An examination of the literature of the many-flowered Podophyllums published from Asia discloses the fact that six species have been described, differing from one another by dissimilarities strikingly analogous to those variable characteristics frequently found in *P. peltatum* and *P. Emodi*,¹ such as the position of the flowers, pubescence, lengths of stamens, and even carpellary number. The specific features of *P. Veitchii* and *P. difforme*, for example, are stamens slightly longer than the petals, and stamens half as long as the petals, respectively; supposed to differ from *P. versipelle*, which is presumed to have stamens and petals of equal length. Upon examination of herbarium² material the writer has been fortunate to find a specimen with two flowers remaining upon the pedicels of the inflorescence, one with stamens longer, and the other with stamens somewhat shorter than the petals (*Henry 5372F*, MBG). Likewise, petals have been found to be notched in a manner similar to that described for *P. Onzoi*. *P. Esquirolii*, furthermore, is said to

¹ A paper dealing with the morphological variability and the involved synonymy which it has produced in the genus *Podophyllum* is now in manuscript.

² In the taxonomic treatment which follows, the herbaria from which exsiccatae have been cited are abbreviated as follows: Gray Herbarium (GH); Missouri Botanical Garden Herbarium (MBG); New York Botanical Garden Herbarium (NY); United States National Herbarium (US). The writer desires to express his appreciation for the facilities which were kindly allowed him by the respective curators of each.

have leaves which are almost without lobing, a feature which might be explained by the great leaf variability of *P. peltatum* and *P. Emodi*. Although predominately extra-axillary, the inflorescence of *Dysosma* has been occasionally found to be axillary. Although perhaps taking too much liberty in doing so, it has been thought advisable in the establishment of the new genus to treat the species described upon such characters as have been found spontaneously variable in *P. peltatum* and *P. Emodi* as representing variations of a single species. Since axillary forms have been reported only from Formosa, it may well be that the position of the umbel is not variable and that the axillary forms are specific. Until better knowledge is available, however, the extra-axillary form is taken as the normal, and the axillary as the abnormal form. Although future study may hold other species genuine, only one, the oldest, which happens to be *P. pleianthum* Hance, has been retained and transferred to *Dysosma*.

***Dysosma*¹ n. gen.**

Herbaceous caulescent perennial, glabrous or somewhat pubescent. Rhizome indeterminate, thickened, fleshy, without cataphyllary scales or prophylls. Leaves 1 or 2, peltate, palmately lobed, the lobes regular, usually 6 large anterior and 2 smaller posterior lobes, regularly denticulate. Flowers in axillary or extra-axillary umbels of 4–19, the pedicels reflexed. Petals usually 6, oblong-lanceolate, dull reddish, drooping. Sepals 3, petaloid, fugaceous. Stamens usually 6; filaments long, unguiculate, spreading from the pistil; anthers 2-celled, dehiscing longitudinally, ventrally parallel, produced from an enlarged

¹ *Dysosma* Woodson gen. nov. Berberidacearum, herba perennis caule erecto glaberrimo pruinoso 3–5 dm. alto; foliis radicalibus solitariis caulinis binis crassiusculis centrice vel subcentrice peltatis orbiculatis palmatim 6–8-lobatis, lobis late triangulo-oblongis acuminatis vix quintam diametri partem aequantibus, margine creberrime subulato-denticulatis, petiolis pruinosis aequilongis; pedicellis declinatis; floribus 4–19 ad apicem caulis infra foliam superius petiola vel inter folia apice caulis nascentibus, ebracteatis; sepalis 3 tantam deciduis; petalis 6–9 oblongis acutis sordide sanguineo-rubris 1.5 cm. longis; stamine 4–6 antheris valvula longitudinali utrinque dehiscentibus introrsis, filamentis unguiculatis aequilongis connectivo ultra loculos in apiculum producto; ovario ellipsoideo-sphaerico gracilibus stigmatibus globosis cristatis coronatis, ovulis indefinitis.

apiculate sterile connective, introrse. Ovary oblong in outline, 1-celled; ovules many, anatropous, each enclosed in a fleshy aril, disposed upon a lateral placenta; stigma globose, thick, produced upon a definite style. Mature fruit unknown, probably a fleshy berry. Type, *Henry 5372F*, Sze-chuan, China, 1885-88 (MBG).

Type species: *Dysosma pleiantha* (Hance) Woodson.

1. *Dysosma pleiantha* (Hance) Woodson, n. comb. Pl. 46.

Podophyllum pleianthum Hance, Jour. Bot. 21: 175. 1883.

Podophyllum versipelle Hance, l. c. 362. 1883.

Podophyllum Veitchii Hemsl. & E. H. Wils., Kew Bull. Misc. Inf. 1906: 152. 1906.

Podophyllum difforme Hemsl. & E. H. Wils., l. c. 1906.

Podophyllum Esquirolii Léveillé in Fedde, Repert. 11: 298. 1912.

Podophyllum Onzoi Hayata, Icon. Pl. Form. 5: 2. 1915.

Characters of the genus.

Distribution: southeastern China and the island of Formosa.

Specimens examined:

CHINA: Hupeh, April, 1885, *Henry 3952* (GH, US); data lacking, Hongkong Botanic Garden, *Ford* (GH); Canton, Lo-fanshan Mts., date lacking, *Ford 1092* (US); Sze-chuan, 1885-88, *Henry 5372* (GH, MBG TYPE, NY, US); Chekiang, 1903, *Barchet 24* (US); Chekiang, 1906, *Barchet* (US); western Hupeh, May, 1907, *Wilson 3202* (US).

EXPLANATION OF PLATE

PLATE 46

Comparative morphology of *Podophyllum* and *Dysosma*.

- Fig. 1. Habit of *Podophyllum Emodi* Wall.
- Fig. 2. Receptacle of *P. Emodi* with pistil and four stamens.
- Fig. 3. Stamen of *P. Emodi*.
- Fig. 4. Diagrammatic cross-section of stamen of *P. Emodi*.
- Fig. 5. Rhizome of *P. Emodi*.
- Fig. 6. Habit of *Dysosma pleiantha* (Hance) Woodson.
- Fig. 7. Receptacle of *D. pleiantha* with pistil and two stamens.
- Fig. 8. Stamen of *D. pleiantha*.
- Fig. 9. Diagrammatic cross-section of stamen of *D. pleiantha*.
- Fig. 10. Rhizome of *D. pleiantha*.